

diagonals trisect one another (orthoidal). The angles of an orthoidal hexagon, other than equilateral, are not 120° . The angles of the left-hand hexagon fig. 1 (§ 7) are 120° , and its paracentric diagonals do not trisect one another, as the diagram clearly shows.

- II. "An Estimate of the Degree of Legitimate Natality, as shown in the Table of Natality compiled by the Author from Observations made at Budapest." By JOSEPH KŐRÖSI, Member of the Hungarian Academy of Sciences, Director of Municipal Statistics. Communicated by Sir JAMES PAGET, F.R.S. Received December 28, 1893.

(Abstract.)

Both branches of the science of demography—natality statistics as well as mortality statistics—originated on British soil. It was in 1665 that the Royal Society published the first work on these matters (Graunt's "Observations"), whilst in 1693 Halley, by establishing the first life table, laid the foundation of the scientific treatment of mortality statistics. These tables of mortality showed for the first time how to measure the probability of *death* for each year of human age. The other branch of vital statistics is still in want of a corresponding table of natality, showing the probability of *birth* for each of the age-combinations of the parents. The table of natality is not of so great scientific importance as the life table, as the probability of death depends on natural laws, whilst the fertility, at least partially, is influenced by voluntary causes also. But as the problems of over-population or de-population are an effect of both forces, it is worth while to study the law of these facts also.

To reach this aim, I have tabulated the age of the 71,800 married couples given in the Census of 1891, conforming to the single year-combinations. The virtual number of these combinations—as 45 productive years of the male have to be combined with each of the 40 productive years of the female—is about 2000. Knowing thus the number of all age-combinations, I observed for four years (two before and two after the Census) the 46,931 births amongst couples of those ages; I got thus, dividing the figures obtained by four, the yearly probability of birth for each age-combination.

As the legitimate natality is to be regarded as a resultant between two distinct forces, the instinct of nature which urges towards multiplication and the forethought which causes moral restraint, it was also desirable to get an insight into the march of the physiological fertility alone. For this purpose I had to look out for couples in whom the moral restraint is weakest or entirely absent. These con-

ditions are fulfilled in newly-married couples, where the physiological factor is nearly exclusively active. I also thus found the degree of physiological natality for different age-combinations. The two curves are very different. The legitimate natality declines after the first child and its fall shows a regular slope. The physiological arrives later at its maximum, remains for some length of time on this culminating height, and decreases only at a more advanced age.

We get thus two degrees of fertility for each age. The difference between the degree of physiological and that of the actual fertility shows, the few cases of procreative exhaustion excepted, the influence of the moral factor. In the somewhat advanced ages this moral restraint exercises an influence exceeding all expectation. With the mothers of 30 to 35 it reduces the fertility to 78 per cent. (instead of 100 per cent.), with those of 43 to 2 per cent., *i.e.*, 98/100 of the physiological faculty is suppressed. With men the influence is also very great, though weaker than with women.

Out of a large number of data here follow some figures to characterise the results :

The fertility is	For the mother.		For the father.	
	Actual.	Physiological.	Actual.	Physiological.
at 25 to 29 years. . . .	29·2 p.c.	30·9 p.c.	35·8 p.c.	28·0 p.c. (?)
„ 30 „ 34 „	20·6 „	32·9 „	27·1 „	27·0 „
„ 40 „ 44 „	5·9 „	20·4 „	13·8 „	21·1 „

The tables containing the fertility of each sex separately I call *monogenous*, the others *bigenous*. Here follow some samples of the *bigenous* tables :

For husbands of 39 years of age the probability of becoming fathers is :

with a wife of 20 years.	31 p.c.
„ 30 „	20 „

For husbands of 40 years of age :

with a wife of 35 years.	27 p.c.
„ 40 „	17 „
„ 45 „	2½ „

I attach a volume of tables containing all the probabilities found, and an atlas of diagrams to make this heavy mass of figures more accessible.